1. Indicate graphically whether each of the following linear programs has a feasible solution. Graphically determine the optimal solution, if one exists, or show that none exists.

a) Maximize z = x1 + 2x2, subject to: x1 − 2x2 ≤ 3, x1 + x2 ≤3, x1, x2 ≥ 0.

1b). Minimize z = x1 + x2, subject to: x1 -x2 ≤ 2, x1 -x2 ≥ −2, x1, x2 ≥ 0

1c). Maximize z = x1 + x2, subject to: x1 -x2 ≤ 2, x1 -x2 ≥ −2, x1, x2 ≥ 0.

1d) Maximize z = 3x1 + 4x2, subject to: x1 − 2x2 ≥ 4, x1 + x2 ≤ 3, x1, x2 ≥